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MWRA

FACTS ABOUT

YOUR DEER ISLAND TOUR

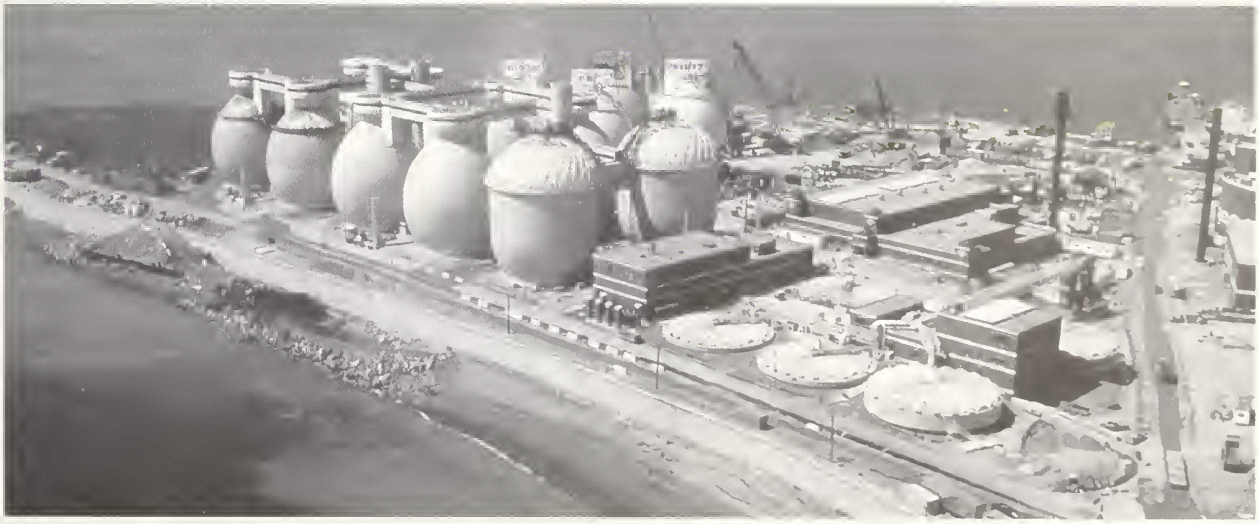
A MASSACHUSETTS WATER RESOURCES AUTHORITY PUBLICATION - SUMMER 1997

Thousands of people visit Deer Island and the new MWRA Deer Island Treatment Plant each year. We welcome ratepayers from the 43 customer communities to see the construction and operation of the new facilities; engineers, contractors and public officials from around the world to see the state of the art in environmental protection facilities; scientists and students to see how modern sewage treatment protects Boston Harbor; and members of the press to report on the progress of this huge effort to bring greater Boston's sewage treatment system into full compliance with state and federal law.

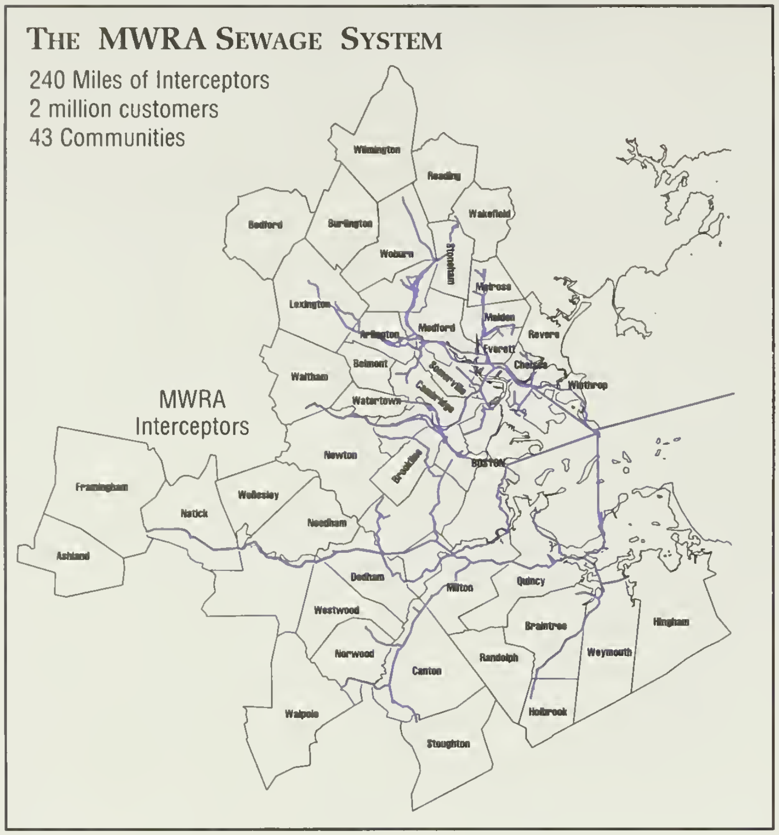
In 1997, visitors to Deer Island will see new primary treatment facilities that have now been operating for over two years, including eight of the towering "egg-shaped digesters" that are part of the recycling of sewage sludge into fertilizer. Construction is continuing on the components of a new secondary treatment plant, one third of which will be in operation this year. The emergency back-up power plant is complete. So are the laboratory building and the administration and warehouse facility. Many visitors will start or end their tours in the restored 1898 pumping station which is also used as a training center for the 400 employees who operate and maintain the new plant. Outside the plant fence, the pathways and landscaping for almost 60 acres of new harbor's edge recreation area are taking shape. Meanwhile, beneath Deer Island, below Boston Harbor and out under Massachusetts Bay, crews continue their round-the-clock work on the project's greatest construction challenge: fourteen miles of deep rock tunnel to carry more sewage to the island and to release fully treated wastewater into Massachusetts Bay.

To ensure a safe, enjoyable visit, please observe the following rules:

- Sturdy, hard soled shoes must be worn. No sandals, no sneakers, no shorts.
- Please keep your hard hat ON. Walk with care. Stay clear of machinery. Respect railings and safety guards.
- No smoking during the tour, even outside, because of methane and oxygen systems.
- Please stay with your guide. And ask as many questions as you like!
- No one under age 18 without special advance arrangements.
- Because this is a functioning sewage treatment plant, follow our workers' hygiene practice and wash your hands carefully after your tour.

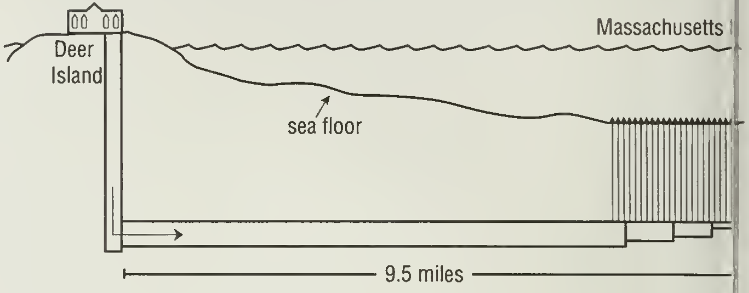


DEER ISLAND IS A WORK IN PROGRESS. THE NEW TREATMENT PLANT CURRENTLY TREATS THE FLOWS OF 22 NORTH SYSTEM COMMUNITIES, OR ABOUT TWO-THIRDS OF THE MWRA SEWER SERVICE AREA. AFTER LATE 1997, WHEN A 4.8 MILE TUNNEL CONNECTING THE OLD TREATMENT PLANT SITE AT NUT ISLAND IS PLACED IN OPERATION, DEER ISLAND WILL TREAT THE SOUTH SYSTEM FLOWS AS WELL. A MAJOR MILESTONE WILL BE ACHIEVED IN 1998 WHEN THE 9.5 MILE EFFLUENT OUTFALL TUNNEL OPENS. FINAL PLANT COMPLETION IS SCHEDULED FOR 1999



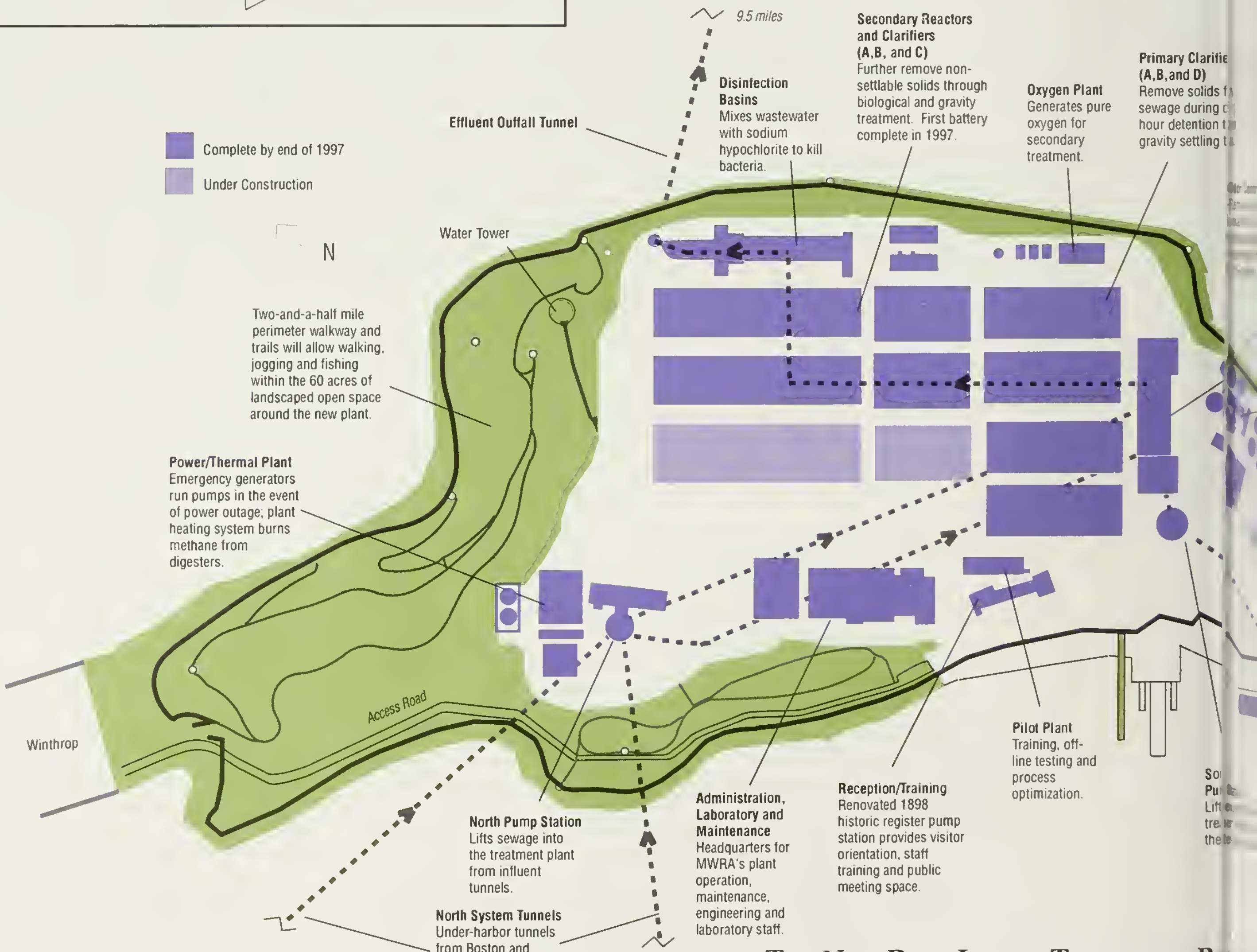
The MWRA Sewage System

240 Miles of Interceptors
2 million customers
43 Communities



Effluent Outfall Tunnel

Beginning in 1998, the plant's treated wastewater will be discharged through 55 pipes rising to the sea floor from the 24 fo
wide 9.5-mile tunnel that has been constructed under Massachusetts Bay. The wastewater will be dispersed at the oc
floor through 8-portal diffuser caps that sit atop each riser pi



🟪 Complete by end of 1997

▨ Under Construction

Effluent Outfall Tunnel

Disinfection Basins
Mixes wastewater with sodium hypochlorite to kill bacteria.

Secondary Reactors and Clarifiers (A,B, and C)
Further remove non-settlable solids through biological and gravity treatment. First battery complete in 1997.

Oxygen Plant
Generates pure oxygen for secondary treatment.

Primary Clarifie (A,B,and D)
Remove solids f
sewage during c
hour detention t
gravity settling t

Two-and-a-half mile perimeter walkway and trails will allow walking, jogging and fishing within the 60 acres of landscaped open space around the new plant.

Power/Thermal Plant
Emergency generators run pumps in the event of power outage; plant heating system burns methane from digesters.

North Pump Station
Lifts sewage into the treatment plant from influent tunnels.

North System Tunnels
Under-harbor tunnels from Boston and Chelsea convey sewage from 22 northern system communities to Deer Island.

Administration, Laboratory and Maintenance
Headquarters for MWRA's plant operation, maintenance, engineering and laboratory staff.

Reception/Training
Renovated 1898 historic register pump station provides visitor orientation, staff training and public meeting space.

Pilot Plant
Training, off-line testing and process optimization.

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The New Deer Island Treatment Pl

WHO WORKS AT DEER ISLAND?

To start-up and operate the new plant MWRA relies on a highly skilled plant staff with diverse training and backgrounds. Here's a quick breakdown of what Deer Island's 400 plant employees and 50 laboratory staff do:

Plant operators hold engineering qualifications and wastewater operator certifications. They manage treatment plant operations.

ELECTRICAL SPECIALIST BILL LANDRY AND OPERATOR LLOYD GREENE

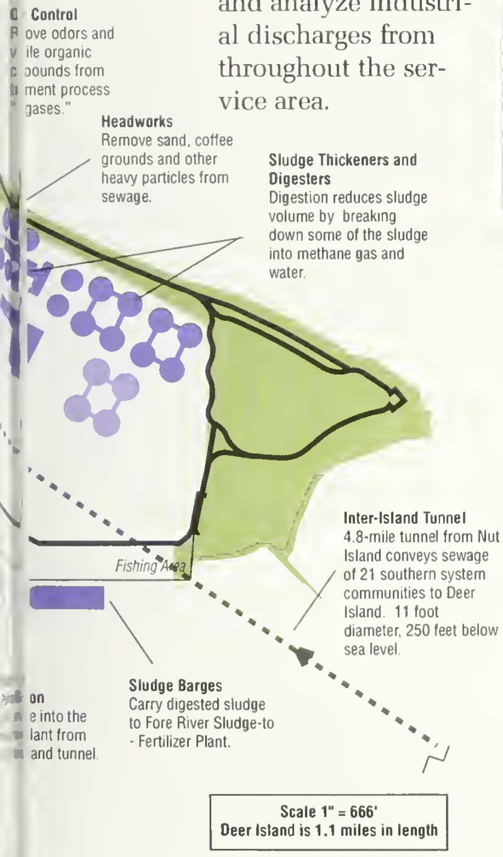
Maintenance tradespeople include electricial and instrumentation specialists, plumbers, machinists, carpenters, painters and numerous other crafts.

Engineering personnel have backgrounds and specialties in civil, mechanical, electrical, computer, process control, instrumentation and many other engineering disciplines.

Management workers provide technical support, purchasing, warehouse management, informational systems, budget and financial control, safety administration and training.

Laboratory staff include technicians and Ph.D.'s to check plant operations, test discharges, monitor Boston Harbor conditions and analyze industrial discharges from throughout the service area.

LAB TECHNICIANS TIM BEAULIEU AND DIANE ROSSI.


C Control
R ove odors and
v ile organic
c pounds from
t ment process
" gases."
Headworks
Remove sand, coffee grounds and other heavy particles from sewage.
Sludge Thickeners and Digesters
Digestion reduces sludge volume by breaking down some of the sludge into methane gas and water.
Fishing Area
Inter-Island Tunnel
4.8-mile tunnel from Nut Island conveys sewage of 21 southern system communities to Deer Island. 11 foot diameter, 250 feet below sea level.
Sludge Barges
Carry digested sludge to Fore River Sludge-to - Fertilizer Plant.
on
e into the
lant from
and tunnel.
Scale 1" = 666'
Deer Island is 1.1 miles in length

WHO BUILT THE NEW PLANT?

In 1985, MWRA was ordered to replace outmoded regional treatment plants whose barely treated sewage discharges polluted Boston Harbor. A schedule for planning, design and construction was ordered by Federal District Court Judge A. David Mazzone after state and federal regulators and citizen plaintiffs proved in a lawsuit that the old plant violated environmental protection statutes.

Planning for the new plant involved citizens and public officials as well as hundreds of engineers in more than a dozen leading civil engineering firms. The plans that emerged ensured that plant components would properly treat sewage flows, meet regulatory requirements and comply with the construction timetables set by the federal court. Deer Island was soon transformed into a 120-acre construction site supported by an elaborate ferry system for workers and construction materials. The peak construction years were 1991-1995, but construction continues to 1999. Sixty seven prime contractors from Massachusetts and around the country and their hundreds of subcontractors and suppliers have bid and built the project under Massachusetts public construction laws and stringent federal and local codes and regulations.

LOCAL 33 ROOFERS PAUL MATHIEU AND MARK MORIARTY

Thousands of men and women of the Boston Building Trades have performed 20 million hours of craft labor on Deer Island construction without one day lost to labor disputes.

The total cost of the entire project is $3.6 billion.

LOCAL 103 ELECTRICIAN VICKI CHAPMAN.

Barges from Deer and Nut Island deliver liquid sludge to the Fore River Sludge-to-Fertilizer Plant; more than 200 tons per week are shipped to growers across the country.

Deer Island: A Special Place with a Special History

Deer Island was formed as a glacial island-drumlin in the last Ice Age and remained an island until beach erosion wrought by the 1938 hurricane caused the bridging of Shirley Gut to Winthrop. The U.S.S. Consitution had sailed through Shirley Gut to escape the British blockade of Boston Harbor during the War of 1812.

Our 21st century uses of Deer Island must respect two particularly sorrowful episodes in the Island's past. In 1675-96, during the Native American resistance known as King Philip's War, several hundred Native Americans from the area that is now Boston's western suburbs were forcibly interned on Deer Island, with shameful loss of life from cold, disease and starvation. Then, from 1847 to 1850, a quarantine station located on Deer Island was the first and last stop in the New World for many ill Irish immigrants fleeing the Irish Famine. MWRA is working with local groups to assure that appropriate memorials on Deer Island honor the several hundred Irish immigrants who were buried on the island as well as the Native Americans who suffered and died on Deer Island 150 years earlier.

Since the mid-ninteenth century, Deer Island has been home to a poor house, reform schools, a county house of corrections, a variety of agricultural uses, military fortifications to protect Boston Harbor from World War II submarine attack and sewage disposal facilities dating from as early as 1898.

For more about Deer Island and Boston Harbor ask us for:

1995 State of the Harbor
  An assessment of the first year's operation of new Deer Island facilities.
Pocket Pal
  A compendium of MWRA facts and Figures.
Fact Sheets
  Boston Harbor History
  Deer Island History
  Boston Harbor Project Overview
  Boston Harbor Project Constuction
  Sludge Processing

Treatment Plant Improvements Aid Boston Harbor's Recovery

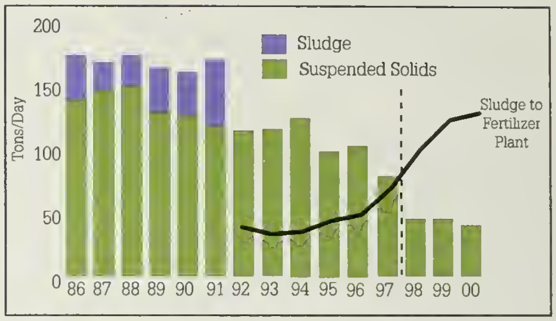


Figure 1
Solids flowing into Boston Harbor from Deer Island decreased dramatically with the end of direct sludge discharges in 1991 and with each successive treatment plant improvement.

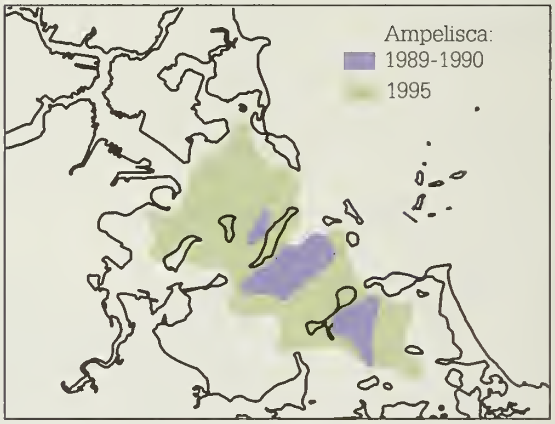


Figure 2
Better sewage treatment has contributed to early ecosystem recovery on the harbor floor where shrimp-like amphipods are increasingly colonizing areas of the harbor floor previously smothered by sewage sediments.

Figure 3
As the water and the beaches have become cleaner, swimmers have returned to Boston Harbor beaches. In 1996, harbor beaches were posted unsafe for swimming fewer than a dozen times and some beaches were not posted at all.

To find out more, or to order MWRA publications, contact MWRA Public Affairs Department at **(617)-241-6057**, order on line at www.mwra.com or write to:

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